
Methods: The Centers of Medicare & Medicaid Services Inpatient claims (2005-2007) were queried with a principal diagnosis of lower extremity artery aneurysm in association with elective CPT codes for open (OPEN) and endovascular (ENDO) repair of popliteal artery aneurysms. Complications, mortality, readmission, and re-interventions were evaluated.

Results: 2,962 patients were identified. The frequency of endovascular interventions increased from 11.7% to 23.6% (p < .0001). The overall complication rates after OPEN (11.3%) and ENDO (9.3%) procedures did not differ significantly (p = 0.17). Cardiac, pulmonary, and infectious complications were more frequent after OPEN whereas hemorrhagic complications occurred more frequently after ENDO. No significant differences in the 30- and 90-day mortality rates were found between OPEN vs. ENDO. Secondary re-interventions for ENDO were greater at both 30 days (4.6% vs. 2.1%; p = .001) and 90 days (11.8% vs. 7.4%; p = 0.0007). Embolectomy and thrombolysis rates over time were significantly higher after ENDO at 30 days (1.82% vs. 0.46%; p = .0006 and 1.46% vs. 0.25%; p = 0.0002) and 90 days (2.73% vs. 0.75%, p < .0002 and 3.28% vs. 0.75%, p < 0.0002). The length of stay (days) was greater for OPEN (4.5 ± 2.5 vs. < .0001), yet total hospital charges were greater for ENDO ($43,180 vs. $35,540, p < .0001).

Conclusions: Despite a significant increase in endovascular repair of popliteal artery aneurysms in the US Medicare population, endovascular repair was associated with greater re-interventions over time. Although endovascular repair had shorter lengths of stay and is considered less invasive, it did not offer a mortality or cost benefit. Further detailed analysis is needed before endovascular repair should be considered the treatment of choice for popliteal aneurysms.


RR20.

Ultrasound-Accelerated Thrombolysis is Superior to Catheter-Directed Thrombolysis for the Treatment of Acute Limb Ischemia

Maria E. Litzendorf, Jean E. Starr, Bhagwan Satiani, Katherine E. Notter. Ohio State University, Columbus, OH

Objectives: Ultrasound-accelerated thrombolysis has become an alternative to traditional catheter-directed thrombolysis for the treatment of acute limb ischemia. The purpose of this study was to compare outcomes and hospital costs for these two treatments.

Methods: A hospital record review was performed of all patients treated with catheter-directed thrombolysis (non-EKOS) versus ultrasound-accelerated thrombolysis (EKOS) from January 2007 through December 2009.
Patient demographics, procedural outcomes, complications, lengths of stay, and hospital economic data were recorded.

Results: A total of 85 patients were treated. 43 underwent EKOS thrombolysis and 42 had non-EKOS thrombolysis. Both treatment groups had similar comorbidities and prior vascular procedures. Total treatment times for the EKOS group were 21.2 hours versus 56.5 hours for the non-EKOS patients (p <0.001). The EKOS group had a higher complete thrombus dissolution rate (95.3% vs 66.7%, p=0.002) and a lower thirty day amputation rate (19.5% vs 42.9%, p=0.04). There was a significantly higher bleeding rate in the non-EKOS group (23.8% vs 4.7%, p=0.026). Length of stay on the vascular service favored the EKOS group (5.7 vs 8.3 days, p=0.027). Total procedural costs were similar for both groups ($18,270 for EKOS vs $16,650 for non-EKOS, p=0.366).

Conclusions: Ultrasound-accelerated arterial thrombolysis had shorter treatment times, higher complete thrombus dissolution rates, lower amputation and bleeding rates, and shorter lengths of stay than patients who underwent traditional catheter-directed thrombolysis. Despite the favorable clinical outcome for EKOS, total procedural costs remained similar.

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RR21.

Early (30 Day) Vein Remodeling is Predictive of Mid-Term Graft Patency Following Lower Extremity Bypass

Warren J. Gasper1, Christopher Owens1, Ji Min Kim1, Mark A. Creager2, Marie Gerhard-Herman2, Timothy Love3, Michael Belkin2, Michael S. Conte1, 1University of California San Francisco, San Francisco, CA; 2Brigham and Women’s Hospital, Boston, MA

Objectives: Successful adaptation of a vein graft to an arterial environment is incompletely understood. We sought to investigate whether early vein graft remodeling is predictive of subsequent patency.

Methods: A prospective longitudinal study of patients undergoing LEB with autologous vein (n=98). Preoperative blood samples were drawn for biomarkers. At the bypass operation, a 5 cm index segment of the graft was registered for serial lumen diameter measurements (1, 3, 6, 9, and 12 months) using duplex ultrasound.

Results: Index segment lumen diameter at 1 month was predictive of primary graft patency (p=0.013, Cox model) with a median follow-up of 28 months. Percent change in vein diameter from 0-1 month showed a trend of positive correlation with primary graft patency (p=0.1). On multivariate regression, larger initial vein diameter (p<0.001), baseline high-sensitivity C-reactive protein (hsCRP) level (p=0.007) and non-white race (p=0.035) were negatively correlated with 0-1 month graft remodeling, while statin use (p=0.049) was positively correlated with remodeling. Similarly, initial diameter (p<0.001), hsCRP (p=0.03) and non-white race were negatively correlated with diameter achieved at 1 month.

Conclusions: Early remodeling of the arterialized vein, measured from a representative mid-graft segment, appears to predict mid-term bypass graft patency. In addition to baseline diameter, race, inflammation (hsCRP) and statin use are associated with early adaptive remodeling, but the mechanism for these observations are not understood.

Index segment diameter at 1 month (by quartiles).

<table>
<thead>
<tr>
<th>Quartile</th>
<th>1 month diameter</th>
<th>Percent diameter change 0-1 months</th>
<th>hsCRP (mg/L)</th>
<th>Primary patency rate at 2 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.37 (0.34-0.39)</td>
<td>11%</td>
<td>4.0 (1.2-25.8)</td>
<td>39%</td>
</tr>
<tr>
<td>2</td>
<td>0.43 (0.41-0.44)</td>
<td>13%</td>
<td>5.1 (1.2-19.3)</td>
<td>44%</td>
</tr>
<tr>
<td>3</td>
<td>0.47 (0.47-0.5)</td>
<td>18%</td>
<td>3.3 (1.8-5.5)</td>
<td>69%</td>
</tr>
<tr>
<td>4</td>
<td>0.59 (0.54-0.65)</td>
<td>45%</td>
<td>2.9 (1.2-4.6)</td>
<td>80%</td>
</tr>
</tbody>
</table>

All values are median (IQR).

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RR22.

Comprehensive Evaluation of Arterial Lesion Characteristics and Their Impact on Long-Term Patency after Endovascular Intervention: The Creation of a Novel Lesion Severity Score For Arterial Lesions

Andrew J. Meltzer1, In-Kyong Kim1, Sikandar Z. Khan1, Natalia Egorova2, Ashley Graham3, James F. McKinsey1, 1Vascular Surgery, New York-Presbyterian Hospital, New York, NY; 2Mount Sinai Medical Center, New York, NY

Objectives: To develop a lesion severity score (LSS) for arterial occlusive lesions that can be used to characterize lesions for comparison and predict effectiveness of intervention.

Methods: Prospective data assessment with patency determined by clinical and duplex criteria from 2005-2009. Variables evaluated by Cox Regression (CR). CR coefficients and Hazard Ratio used to derive risk factor scores; these were summed to create a LSS. Correlation between LSS and patency performed with Kaplan-Meier and CR.

Results: 1848 lesions were treated in 1049 patients. 44 variables were examined; statistically significant factors were included in the final model (Table 1). Outcome worsened with increasing LSS (Table 2).